

Metabolic syndrome and Obstructive sleep apnea - Syndrome Z

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Obstructive sleep apnea (OSA) and metabolic syndrome together constitutes “syndrome Z”. There is now ample evidence of independent associations of OSA with systemic hypertension, insulin resistance, ischaemic heart disease and stroke. The metabolic syndrome (MS) is a risk factor for development of cardiovascular disease and is closely associated with obstructive sleep apnoea (OSA). It has been hypothesized that the OSA may be a manifestation of MS. Treatment of OSA, most notably with nasal CPAP (continuous positive airway pressure), has been shown in large studies to decrease cardiovascular morbidity and mortality^{1,2}.

Each component of the metabolic syndrome has an independent and significant impact on the health status of the individual. However, the morbidity and mortality associated with syndrome Z are reported to be multiplicative rather than additive. Moreover, OSA is an independent risk factor for cardiovascular disease over and above the components of the metabolic syndrome. Therefore, screening for OSA in addition to the metabolic syndrome would provide extra health benefits. The prevalence of OSA is thought to be about 4% and that of the metabolic syndrome about 20%³. The exact prevalence of syndrome Z in the community has not been looked at to date.

Several studies suggest that the prevalence of MS according to National Cholesterol Education Programme Adult Treatment Panel (NCEP-ATP) III criteria is about 40 per cent greater in obstructive sleep apnoea (OSA). Though there is circumstantial evidence to implicate OSA in the development of MS, the causal relationship remains unproven.

Animal studies suggest that diabetes may lead to a marked depression in ventilatory control mechanisms. It has been hypothesized that in the setting of OSA and MS, there probably exists a feedforward relationship between the two which leads to further aggravation of both disorders. It has been proposed that the OSA may be one of the manifestations of MS. Though several human studies suggest that the OSA is independently associated with insulin resistance and other components of the MS, published data are conflicting.

A recent study by S. Venkateswaran et al showed that the metabolic syndrome was an independent predictor of OSA. In this study, analysis was performed to find out the ages at which the OSA, MS and syndrome Z exist in the study subjects. Findings of this study provide an indication that in subjects with normal BMI, MS develops first followed by OSA and eventually syndrome Z develops. With BMI >25 or >30 no clear-cut difference was noted. It is plausible that differential activation of selective genes may be possible through gene environment interaction and appearance of these conditions. However, to have a better understanding about which occurs first MS or OSA, before a person develops syndrome Z, a well-planned cohort study on presently normal individuals with regular monitoring including polysomnography and various metabolic parameters is required^{3,4}.

AK Janmeja et al⁵ compared prevalence of metabolic syndrome in north Indian patients with and without OSA. Findings of the study revealed that Metabolic syndrome was significantly higher among patients of OSA as compared to patients without OSA among North Indian patients. However, the author concluded that further multicentric studies are essential to reconfirm the results on Indian population and also recommended that polysomnography must be done in all patients of metabolic syndrome for detection of OSA.

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Original article in this journal, a study by R S Khot et al⁶ documented prevalence of syndrome Z in type 2 diabetes mellitus as 27.6%. Study demonstrated prevalence of MS as 35.8% and OSA in 49.2%. Syndrome Z was more common with advancing age and had a female preponderance. Hypertension had an independent association with syndrome Z. Individual components of metabolic syndrome also demonstrated association with syndrome Z.

It may be suggested - therefore, that every patient with the metabolic syndrome should be screened for OSA, at the very least by taking a sleep history and using the Epworth sleepiness scale. If results are positive, a diagnostic sleep study should be performed. In fact the metabolic syndrome itself could serve as a marker of OSA. This is an important for the future research as the prevalence of obesity is increasing worldwide and with this increase the prevalence of OSA, MS and syndrome Z will also increase tremendously. This will require urgent

public health intervention strategies otherwise health resources of the developing and developed nations will be overburdened.

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